Attachment C

Measuring Delay and Congestion: Annual Update

Case Studies – Before and After Results

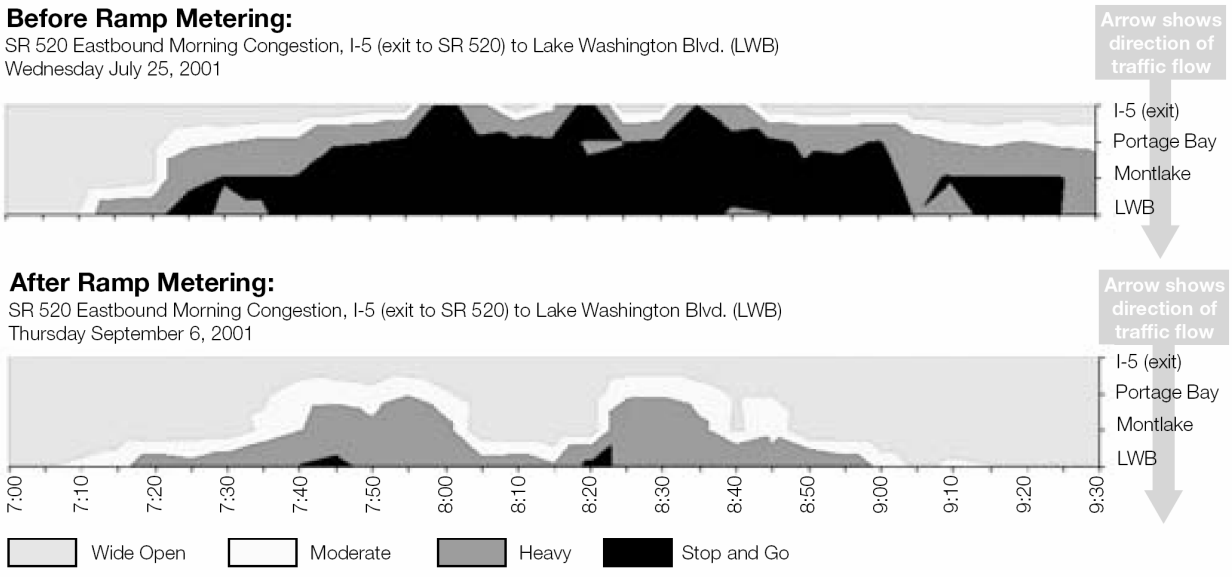
Case Study 1 - Ramp Metering

Smoother Merging, More Throughput, and Higher Speeds

Reducing highway traffic congestion is the primary goal of ramp metering. Ramp meters respond to actual traffic conditions, linking computers with sensors embedded in the ramps and on the freeways near the ramps. These act as metal detectors, registering when a car or motorcycle passes over the sensor. This information is fed to a central computer, that in turn adjusts the rate at which the ramp meter signal releases drivers to enter the mainline. If cars start to back up onto the city street, the ramp meter automatically speeds up to clear the queue. If traffic is light on the highway, the meter also speeds up to allow more cars to merge. If traffic is heavy everywhere, which is often the case during peak hours, the computer optimizes the flow. Ramp meters help smooth traffic flow. The Transportation Management Center in Seattle monitors over 150 freeway ramp meters, and one in Vancouver, during congested hours on all days. Ramp metering reduces congestion while increasing throughput and freeway speeds.

How do we know ramp meters reduce congestion?

The following chart shows traffic conditions on SR 520 between I-5 and the floating bridge on a typical morning (July 25, 2001) without ramp metering.



Source: WSDOT NWR Traffic Operations

Before

Reading the top graph, the black shading shows stop-and-go traffic from 7:30 a.m. to 9:30 a.m., extending back to I-5 at different times. At 8:00 a.m. on this day, traffic flow on SR 520 eastbound was at a rate of 2,780 vehicles per hour.

After

The bottom graph shows a typical morning (Sept. 6, 2001) after ramp metering was activated along the corridor. Stop-and-go traffic was limited to a total duration of about 15 minutes and never extended west of Montlake Blvd. NE. At 8:00 a.m. on this day, traffic flow on SR 520 was at a rate of 3,265 vehicles per hour.